
# Short Course on October 7, 2012

Title: **Medical Ultrasound Transducers**

Instructors: **Douglas G. Wildes, L. Scott Smith**, GE Global Research

## *Course Description*

This course will provide an introduction to the design, fabrication, and testing of medical ultrasound transducers. Starting from an overview of the basic types of phased-array transducers (linear, convex, sector), we will discuss how the design for a probe is derived from its target application and how equivalent-circuit, finite-element, and acoustic field models can be used to optimize the design and accurately predict performance. A discussion of the structure of an ultrasound probe will lead to a survey of the different types of materials used in probes and their critical properties. Typical fabrication processes will be introduced and common problems in probe manufacturing will be summarized. Methods for evaluating completed transducers will be discussed. The course will highlight recent developments in probe technology, including single crystal piezoelectrics, cMUT transducers, catheters, 2D arrays, and electronics in probes, and will discuss performance advantages and fabrication difficulties which may be associated with each.

***Douglas G. Wildes*** is a physicist with GE Global Research. He earned an A.B. in physics and mathematics from Dartmouth College, and a Ph.D. in low-temperature physics from Cornell University then joined GE in 1985. Since 1991, Dr. Wildes' research has focused on aperture design, fabrication processes, and high-density interconnect technology for multi-row and 4D imaging transducers for medical ultrasound. Dr. Wildes has 31 issued patents and 24 external publications. He is a member of the American Physical Society and a Senior Member of the IEEE.

***L. Scott Smith*** leads the Ultrasound Probes Lab at GE Global Research. He earned B.S. and Ph.D. degrees in physics from the University of Rochester and the University of Pennsylvania respectively. Joining GE in 1976, he developed phased array probes for medical ultrasound. More recently, he led projects on adaptive acoustics and novel probe materials and methods. Dr. Smith has 51 issued patents and over 35 refereed publications. He is a member of the American Physical Society and a Senior Member of the IEEE where he serves as an Associate Editor for the Transactions on UFFC, and on this symposium's Technical Program Committee.

**Conference website: http://ewh.ieee.org/conf/ius_2012**

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